

## INTERNATIONAL SEARCH REPORT

International application No.

PCT/US04/39240

COPY

<b>A. CLASSIFICATION OF SUBJECT MATTER</b> IPC: C07D 487/22( 2006.01)  USPC: 540/145 According to International Patent Classification (IPC) or to both national classification and IPC																				
<b>B. FIELDS SEARCHED</b> Minimum documentation searched (classification system followed by classification symbols) U.S. : 540/145  Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched  Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)																				
<b>C. DOCUMENTS CONSIDERED TO BE RELEVANT</b>																				
Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.																		
A	US 5,493,017 A (THERIEN et al) 20 February 1996 (20.02.1996), column 2, lines 1-54.	1-24																		
<input type="checkbox"/> Further documents are listed in the continuation of Box C. <input type="checkbox"/> See patent family annex.																				
<table border="0"><tr><td>* Special categories of cited documents:</td><td>"T"</td><td>later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention</td></tr><tr><td>"A" document defining the general state of the art which is not considered to be of particular relevance</td><td>"X"</td><td>document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone</td></tr><tr><td>"E" earlier application or patent published on or after the international filing date</td><td>"Y"</td><td>document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art</td></tr><tr><td>"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)</td><td>"&amp;"</td><td>document member of the same patent family</td></tr><tr><td>"O" document referring to an oral disclosure, use, exhibition or other means</td><td></td><td></td></tr><tr><td>"P" document published prior to the international filing date but later than the priority date claimed</td><td></td><td></td></tr></table>			* Special categories of cited documents:	"T"	later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention	"A" document defining the general state of the art which is not considered to be of particular relevance	"X"	document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone	"E" earlier application or patent published on or after the international filing date	"Y"	document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art	"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)	"&"	document member of the same patent family	"O" document referring to an oral disclosure, use, exhibition or other means			"P" document published prior to the international filing date but later than the priority date claimed		
* Special categories of cited documents:	"T"	later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention																		
"A" document defining the general state of the art which is not considered to be of particular relevance	"X"	document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone																		
"E" earlier application or patent published on or after the international filing date	"Y"	document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art																		
"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)	"&"	document member of the same patent family																		
"O" document referring to an oral disclosure, use, exhibition or other means																				
"P" document published prior to the international filing date but later than the priority date claimed																				
Date of the actual completion of the international search 06 January 2007 (06.01.2007)		Date of mailing of the international search report 09 FEB 2007																		
Name and mailing address of the ISA/US Mail Stop PCT, Attn: ISA/US Commissioner for Patents P.O. Box 1450 Alexandria, Virginia 22313-1450 Facsimile No. (571) 273-3201		Authorized officer James O Wilson <i>Felicia D. Roberts</i> Telephone No. 571-272-2908 <i>for</i>																		

(19) World Intellectual Property Organization  
International Bureau



(43) International Publication Date  
3 November 2005 (03.11.2005)

PCT

(10) International Publication Number  
**WO 2005/103056 A3**

(51) International Patent Classification:  
C07D 487/22 (2006.01)

(21) International Application Number:  
PCT/US2004/039240

(22) International Filing Date:  
24 November 2004 (24.11.2004)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:  
10/812,156 29 March 2004 (29.03.2004) US

(71) Applicant: **WELLSPRING PHARMACEUTICAL CORPORATION** [US/US]; 1430 State Route 34, Neptune, NJ 07753-6807 (US).

(72) Inventors; and

(75) Inventors/Applicants (for US only): **VUKOVICH, Robert** [US/US]; 7 Taylor Run, Holmdel, NJ 07733 (US). **LEVINSON, Benjamin** [US/US]; 91 Dead Tree Run Road, Montgomery, NJ 08502 (US). **DRUMMOND, George, S.** [GB/US]; 304 W. 75th Street, New York, NY 10023 (US). **CAROSELLI, Robert, R., Ph.** [US/US]; 5 Independence Drive, East Brunswick, NJ 08816 (US). **ANTCZAK, Kazimierz, G.** [CA/US]; 7824 Blue Heron

Ct., Culver, IN 46511 (US). **BOUCHER, Christopher** [CA/CA]; 37 Harrison Drive, Newmarket, Ontario L3Y 4P3 (CA). **MORTIMER, Richard** [CA/CA]; 98 Glenvale Boulevard, Toronto, Ontario M4G 2V9 (CA). **LEVIN, Danny** [CA/CA]; 27 McGlashan Court, Toronto, Ontario M5M 4M6 (CA). **COOKE, Keith, A.** [CA/CA]; 470 Gowland Cres., Milton, Ontario L9T 4E5 (CA).

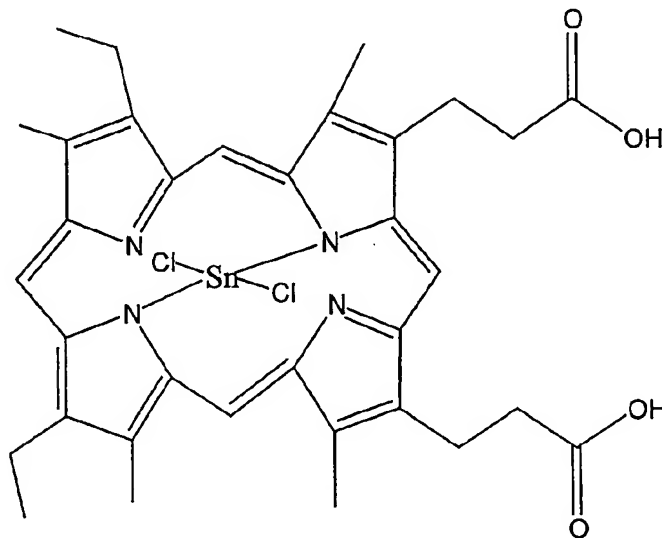
(74) Agents: **SERVILLA, Scott, S.** et al.; Norton & Dichl, LLC, 77 Brant Avenue, Suite 110, Clark, NJ 07066 (US).

(81) Designated States (unless otherwise indicated, for every kind of national protection available): AF, AG, AI, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GI, GM, GR, GU, HK, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MY, MZ, NA, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW.

(84) Designated States (unless otherwise indicated, for every kind of regional protection available): ARIPO (BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IS, IT, LU, MC, NL, PL, PT, RO, SE,

[Continued on next page]

(54) Title: PREPARATION OF METAL MESOPORPHYRIN HALIDE COMPOUNDS



(57) Abstract: A method of preparing metal mesoporphyrin halide compounds is described. The metal mesoporphyrin halide compound may be formed by forming a novel mesoporphyrin IX intermediate compound and then converting the mesoporphyrin IX intermediate to the metal mesoporphyrin halide through metal insertion. The novel intermediate compound may be formed by a catalytic hydrogenation of hemin in acid and subsequent recovery.



SI, SK, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ,  
GW, ML, MR, NE, SN, TD, TG).

(88) Date of publication of the international search report:  
10 May 2007

**Published:**

— with international search report

*For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.*